AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-2. (canceled).

Claim 3. (currently amended): A semiconductor device comprising:

an insulating underlayer;

a first insulating interlayer formed on said insulating underlayer, said first insulating interlayer having a groove;

a first metal layer having silicon atoms diffused within said first metal layer, and wherein said ~~silicon-diffused~~ first metal layer is buried in said groove; and

a first metal diffusion barrier layer formed on said first ~~silicon-diffused~~ metal layer and said first insulating interlayer, wherein

said first insulating interlayer comprises at least one of a SiO_2 layer, a SiCN layer, a SiC layer, a SiOC layer and a low-k material layer and

said low-k material layer comprises one of a ladder-type hydrogen siloxane layer and a porous ladder-type hydrogen siloxane layer.

Claim 4. (original): The device as set forth in claim 3, wherein said ladder-type hydrogen siloxane layer comprises an L-OxTM layer.

Claim 5. (original): The device as set forth in claim 3, wherein said ladder-type hydrogen siloxane layer has a density of about 1.50 g/cm^3 to 1.58 g/cm^3.

Claim 6. (original): The device as set forth in claim 3, wherein said ladder-type hydrogen siloxane layer has a refractive index of about 1.38 to 1.40 at a wavelength of about 633 nm.

Claim 7. (original): The device as set forth in claim 3, further comprising a mask insulating layer made of silicon dioxide formed on the one of said ladder-type hydrogen siloxane layer and said porous ladder-type hydrogen siloxane layer.

Claims 8-14. (canceled).

Claim 15. (currently amended): A semiconductor device comprising:

an insulating underlayer;

a first insulating interlayer formed on said insulating underlayer, said first insulating interlayer having a groove;

a first metal layer having silicon atoms diffused within said first metal layer, and wherein said ~~silicon-diffused~~ first metal layer is buried in said groove; and

a first metal diffusion barrier layer formed on said first ~~silicon-diffused~~ metal layer and said first insulating interlayer, wherein said first metal diffusion barrier layer comprises at least one of a SiCN layer, a SiC layer, a SiOC layer and an organic material layer.

Claim 16. (previously presented): A semiconductor device comprising:

an insulating underlayer;

a first insulating interlayer formed on said insulating underlayer, said first insulating interlayer having a groove;

a first silicon-diffused metal layer buried in said groove;

a first metal diffusion barrier layer formed on said first silicon-diffused metal layer and said first insulating interlayer; and

a first etching stopper between said insulating underlayer and said first insulating interlayer.

Claim 17. (original): The device as set forth in claim 16, wherein said first etching stopper comprises at least one of a SiCN layer, a SiC layer, a SiOC layer and an organic material layer.

Claims 18-50. (canceled).

Claim 51. (previously presented): A semiconductor device comprising:

an insulating underlayer;

an insulating interlayer formed on said insulating underlayer, said insulating interlayer having a groove;

a barrier metal layer made of at least one of Ta, TaN, Ti, TiN, TaSiN and TiSiN formed within said groove;

a silicon-diffused copper layer including no copper silicide formed thereon and and buried in said groove on said barrier metal layer, said silicon-diffused copper layer having a silicon component of less than 8 atoms %; and

a copper diffusion barrier layer made of at least one of SiCN, SiC, SiOC and organic material and formed on said silicon-diffused copper layer and said insulating interlayer.

Claims 52-214. (canceled).

Claim 215. (currently amended): A semiconductor device comprising:

an insulating underlayer;

a first insulating interlayer formed on said insulating underlayer, said first insulating interlayer having a groove;

a first metal layer having silicon atoms diffused within said first metal layer, and wherein said ~~silicon-diffused~~ first metal layer including no carbon therein is buried in said groove; and

a first metal diffusion barrier layer formed on said first ~~silicon-diffused~~ metal layer and said first insulating interlayer,

wherein said first silicon-diffused metal layer has a larger silicon concentration near an upper side thereof than near a lower side thereof.

Claim 216. (currently amended): A semiconductor device comprising:

an insulating underlayer;

a first insulating interlayer formed on said insulating underlayer, said first insulating interlayer having a groove;

a first metal layer having silicon atoms diffused within said first metal layer, and wherein said ~~silicon-diffused~~ metal layer including no carbon therein is buried in said groove; and

a first metal diffusion barrier layer formed on said first ~~silicon-diffused~~ metal layer and said first insulating interlayer,

wherein said first metal diffusion barrier layer comprises at least one of a SiCN layer, a SiC layer, a SiOC layer and an organic material layer.

Claim 217. (currently amended): A semiconductor device comprising:

an insulating underlayer;

a first insulating interlayer formed on said insulating underlayer, said first insulating interlayer having a groove;

a first metal layer having silicon atoms diffused within said first metal layer, and wherein said ~~silicon-diffused~~ metal layer including no carbon therein is buried in said groove; and a first metal diffusion barrier layer formed on said first ~~silicon-diffused~~ metal layer and said first insulating interlayer,

further comprising a first etching stopper between said insulating underlayer and said first insulating interlayer.

Claim 218. (currently amended): A semiconductor device comprising:

an insulating underlayer;

a first insulating interlayer formed on said insulating underlayer, said first insulating interlayer having a groove;

a first metal layer having silicon atoms diffused within said first metal layer, and wherein said ~~silicon-diffused~~ metal layer including no carbon therein is buried in said groove; and

a first metal diffusion barrier layer formed on said first ~~silicon-diffused~~ metal layer and said first insulating interlayer,

wherein said first etching stopper comprises at least one of a SiCN layer, a SiC layer, a SiOC layer and an organic material layer.